

PHOENIX-GOODYEAR AIRPORT SUPERFUND SITE
GOODYEAR, ARIZONA

EXPLANATION OF SIGNIFICANT DIFFERENCES

U.S. Environmental Protection Agency
Region IX - San Francisco, California
January 1991

Phoenix-Goodyear Airport Superfund Site Final Remedy

EXPLANATION OF SIGNIFICANT DIFFERENCES

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I. INTRODUCTION

On September 26, 1989, the United States Environmental Protection Agency (EPA) signed a Record of Decision (ROD) for the final remedy at the Phoenix-Goodyear Airport (PGA) Site in Goodyear, Arizona. The State of Arizona concurred with the remedy selected in the 1989 ROD. The purpose of this Explanation of Significant Differences (ESD) is to explain the significant differences between the final remedy originally selected in the 1989 ROD and the final remedy which will be implemented at the Site. These changes are not fundamental alterations of the remedy described in the 1989 ROD.

Under Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendment and Reauthorization Act of 1986 (CERCLA), and pursuant to 40 C.F.R. Section 300.435(c)(2)(i) (55 Fed.Reg. 8666, 8852 (March 8, 1990)), EPA is required to publish an Explanation of Significant Difference when significant (but not fundamental) changes are made to a final remedial action plan as described in a ROD.¹

This document provides a brief background of the Site, a

¹If the changes made after the ROD was signed had fundamentally altered the nature of the selected remedy, then a ROD amendment would have been prepared. 40 C.F.R. Section 300.435(c)(2)(ii)(1990).

summary of the remedy selected in the ROD, a description of how the changes affect the remedy originally selected by EPA in the 1989 ROD, and an explanation of why EPA is making these changes to the ROD.

EPA is issuing this ESD in order to take into account information received after the ROD was signed in September 1989, and to clarify some ambiguities in the selected remedy.

This ESD:

(1) revises the cleanup level for methyl ethyl ketone (MEK) in groundwater from 170 parts per billion (ppb) to 350 ppb;

(2) sets the cleanup level for acetone in groundwater at 700 ppb;

(3) clarifies the target area for the soil remedy in the northern portion of the Site and the criteria for establishing the cleanup levels;

(4) clarifies the role of soil excavation as a remedy option should the selected soil remedy, soil vapor extraction, at the northern portion of the Site prove ineffective; and

(5) revises the selected remedy for an off-site agricultural well referred to as the "Phillips Well" from well-head treatment to routine water quality monitoring.

The ESD and supporting documentation will become part of the PGA Administrative Record. Copies of the Administrative Record have been placed at the following location:

City of Avondale Public Library
328 West Western Avenue
Avondale, Arizona 85323
(602) 932-9415

EPA provided a fifteen (15) day comment period for the State of Arizona in accordance with 40 C.F.R. Section 300.515(h)(3). State of Arizona comments are summarized in this ESD and will be included in the PGA Administrative Record file. Pursuant to 40 C.F.R. Section 300.435(c)(2)(i), a public comment period is not required for an ESD.

II. BACKGROUND

The following provides a brief background of the PGA Site and a short summary of the remedy selected in the ROD. Additional background information can be found in the September 26, 1989 ROD and in the PGA Administrative Record.

A. Site Background and Description

The PGA Site is located primarily in Goodyear, Arizona, approximately seventeen (17) miles west of Phoenix in the western part of the Salt River Valley (See Attachment 1). A groundwater flow divides the Site along Yuma Road into northern and southern study areas. In 1981, the Arizona Department of Health Services (ADHS) discovered that groundwater in the area of the Site was contaminated with solvents and chromium. EPA and ADHS conducted additional sampling of wells in 1982 and 1983 which revealed 18 wells contaminated with trichloroethylene (TCE). As a result, EPA added the PGA Site to the National Priorities List in September 1983, originally listed as the "Phoenix-Litchfield Airport Area Superfund Site". Other hazardous substances found at the PGA Site include methyl ethyl ketone (MEK), 1,1,1-trichloroethane (TCA), acetone, and other volatile organic compounds (VOCs).

Most of the groundwater and soil contamination in the southern portion of the Site is located within an area of the Site designated as "Section 16". Contaminated shallow groundwater (Subunit A) at the southern portion of the Site is being addressed by a separate remedy referred to as the "Section 16 operable unit". A Record of Decision for the Section 16 operable unit was signed on September 29, 1987. The designated remedy of a pump and treat system for Subunit A groundwater has been operating since December 1989. The 1989 ROD addresses the final remedy for this site as described below and incorporates the remedy selected for the Section 16 operable unit.

The current land uses on and near the Site consist of agricultural, industrial, and residential uses. Groundwater currently used for drinking water meets federal and state drinking water standards. As municipal water supplies in the area of the Site are solely dependent on groundwater, future population growth in the area could require use of groundwater in contaminated areas and may result in potential exposure to hazardous substances.

B. Remedy Selected in the 1989 ROD

The ROD for the final remedy at the PGA Site was signed by the EPA Regional Administrator on September 26, 1989. In addition to the remedial action described below, the final remedy also incorporates the Section 16 operable unit.

For the southern half of the Site, the remedy consists of extraction and treatment of Subunit B/C groundwater and soil vapor extraction for the vadose zone. The groundwater remedial action

requires a pump and treat system using air stripping to remove VOCs from the groundwater. The ROD states that groundwater remedial action shall continue to use twenty existing wells for extraction and requires the addition of new wells for extraction and treatment. A central plant will be constructed to treat the water from all but one of the new extraction wells. The one remaining extraction well is commonly referred to as the "Phillips Well" (after the owner of the property on which the well is located). The 1989 ROD requires treatment at the wellhead for the Phillips Well because it exceeded ARARs for TCE and is located a significant distance from the proposed location of the central treatment plant. The ROD requires that groundwater be provided to current users of the existing twenty extraction wells, with the treated water from the central treatment plant available to the City of Goodyear for municipal use.

A soil vapor extraction (SVE) system was selected for the contaminated vadose zone. The SVE system will be implemented in an area identified as Target Area 2 in Figure 5-2 of the ROD. The total present worth cost of the extraction and treatment facilities for the groundwater remedy for the southern portion of the Site is estimated at \$9,160,000. The total present worth cost of the soil remedy for the southern portion is estimated to be from \$3,904,000 for a phased implementation, to \$5,370,000 for a full scale implementation.

The remedial action selected for the northern portion of the Site is similar to that chosen for the south and includes a

Subunit A and Subunit B/C groundwater remedy and a soil remedy. The groundwater remedy consists of a pump and treat system using air stripping, followed by liquid phase granular activated carbon to remove VOCs from the groundwater. Air emission controls are required for the groundwater remedy. The ROD requires that the treated water from Subunit A be reinjected, and the treated water from Subunit B/C be available for incorporation into the community water supply. The soil remedy consists of a SVE system with air emission controls to be implemented in the target area. The ROD identifies the target area as that area where VOCs were detected in soil samples and the area where soil gas samples exhibited VOCs greater than 1 ug/l. The ROD provides that this area may be expanded or reduced, as necessary, to include removal of 99 percent of the contaminants. In addition, the ROD states that excavation and treatment may be required to remove residual contamination where soil vapor extraction is not effective. The estimated present worth cost of the groundwater remedy for the northern portion of the Site is \$14,027,000. The estimated present worth cost of the SVE system is \$3,136,000.

ARARs for the PGA Site are identified in Table 2-5 of the ROD (See Attachment 2). The ARARs for the operable unit are identified in Table 2-5 and in Table 1 of the 1987 ROD.

III. DESCRIPTION OF SIGNIFICANT DIFFERENCES

This ESD clarifies and modifies portions of EPA's September 1989 ROD. To the extent that this ESD differs from the ROD, the ESD supersedes the ROD. The significant differences contained in

this ESD are described below.

A. Cleanup Level for Methyl Ethyl Ketone in groundwater

Table 2-5 of the ROD shows the ARARs for the PGA Site. The cleanup level for MEK in groundwater is identified as 170 parts per billion (ppb) based on the levels set by Federal Ambient Water Quality Criteria (AWQC) and by the Arizona Department of Environmental Quality (ADEQ) Action Level. After the ROD was signed, EPA discovered that an AWQC level has not been set for MEK and that the ADEQ Action Level is not "promulgated", a necessary requirement for a state ARAR². As a result, neither of these two standards is applicable nor is relevant and appropriate; the MEK level was identified as an ARAR in error. In fact, no ARARs are in effect for MEK in groundwater. EPA has reviewed additional information and has determined that the correct cleanup level for MEK in groundwater at the PGA Site is 350 ppb. Section 300.400(g)(3) of the NCP allows EPA to use advisories, criteria, or guidance developed by EPA, other federal agencies, or states which may be useful in developing CERCLA remedies. This category of information is referred to as "to be considered" (TBC) and can be used to set cleanup levels when ARARs do not exist. The preamble to the NCP states as follows:

"when an MCLG or MCL does not exist for a particular contaminant, EPA intends that the lead or support agency use EPA-developed toxicity information such as cancer potency factors and reference doses for noncarcinogenic effects when developing preliminary remediation goals."

² This requirement is found in Section 300.400(g)(4) of the National Contingency Plan, issued on March 8, 1990, which was proposed at the time EPA signed the ROD for the PGA Superfund Site.

In accordance with the NCP, EPA has used TBC guidance and criteria to establish the cleanup level for MEK at 350 ppb. EPA has reached this cleanup level by using the reference dose for MEK and applying the procedure for calculating MCLGs as established by the proposed National Primary and Secondary Drinking Water Regulations. 54 Fed. Reg. 22062 (May 22, 1989). The MCLGs set cleanup levels for current or potential drinking water sources. As discussed in the 1989 ROD, all ARARs at the PGA Site are set at drinking water standards (See pages 2-21 and 2-23 of the 1989 ROD).

The MCLG calculation for MEK is as follows:

$$\text{MEK MCLG} = \frac{(\text{Rfd-MEK})}{2 \text{ liters water consumed per day}} \times (70 \text{ kg adult}) \times \text{RSCF} = 350 \text{ ppb}$$

where: Rfd-MEK, the MEK toxicological risk reference dose found in the EPA's Integrated Risk Information System (IRIS) database, equals 50 micrograms per kilogram per day; and,

RSCF, the relative source contribution factor, the percent of exposure to MEK that may be attributed to drinking water at or near the Site is 20 percent.

The PGA Site Risk Assessment did not address the potential routes of exposure for MEK³. Therefore, in accordance with the proposed National Primary and Secondary Drinking Water Regulations⁴, EPA has determined that the most protective RSCF (20 percent) is appropriate for the PGA Site. The proposed regulations

³ The PGA Site Risk Assessment is located in Appendix R, Volume 5 of the PGA Remedial Investigation/Feasibility Study, dated June 1989.

⁴ Although not yet final, EPA uses the procedures contained in these regulations (54 Fed. Reg. 22062, dated May 22, 1989) to calculate MCLGs.

recommend that when calculating the MCLGs, the following approach be taken:

"[w]hen data did not exist, EPA then estimated drinking water's contribution at 20 percent of total exposure. This value was considered protective and conservative and accounts for the range of actual (but unknown) exposures from different sources." 54 Fed. Reg. 22069.

Moreover, EPA has determined that the use of a 20 percent RSCF is also appropriate based on the following information:

(1) groundwater is the primary source of drinking water in Arizona and potential exposure to VOCs via drinking water is highly probable; and

(2) persons working on-Site and nearby residents have potential exposure to VOCs from inhalation due to possible emissions of VOCs during clean-up activities on-Site and from nearby industry.

B. Cleanup Level for Acetone in Groundwater

Table 2-5 of the ROD did not contain a cleanup level for acetone because acetone has not yet been detected in the groundwater at the PGA Site. Yet, acetone has been detected in soil in the northern portion of the Site. Because acetone migration to groundwater is possible, EPA has determined that a cleanup level for acetone in groundwater should be added to Table 2-5 of the ROD. In addition, a cleanup level for acetone in groundwater is needed to determine the cleanup level for acetone in the soil upon applying the EPA-approved contaminant transport model. The cleanup level for acetone in the soil will be determined based upon a decision-tree described in the 1989 ROD and

will be related to the cleanup level for acetone in groundwater.

In the manner described below, EPA has determined that the appropriate cleanup level for acetone in the groundwater is 700 ppb. As there are no ARARs in effect for acetone, EPA has calculated the MCLG as described above for MEK. The MCLG calculation for acetone is as follows:

$$\text{Acetone MCLG} = \frac{(\text{Rfd-Acetone}) \times (70 \text{ kg adult})}{2 \text{ liters water consumed per day}} \times \text{RSCF} = 700 \text{ ppb}$$

where: Rfd-Acetone is 100 micrograms per kilogram per day;
and,
RSCF is 20 percent.

As with MEK, EPA applied a 20 percent RSCF due to a lack of information regarding the routes of exposure for acetone in the Risk Assessment for the PGA Site.

C. Phillips Well

As previously discussed above, the 1989 ROD required treatment for the Phillips well at the well head. EPA selected this remedy based on EPA sampling of the well prior to 1989, which indicated an average concentration of trichloroethylene (TCE) of 10.3 micrograms per liter (ug/l) at this well⁵. The ARAR for TCE is 5.0 ug/l. Representatives of EPA, Arizona Department of Environmental Quality (ADEQ), and the Goodyear Tire & Rubber Company (GTRC) sampled the Phillips well again on July 24, 1990. Samples were taken from both the wellhead of this agricultural well and at the first points of discharge to irrigation canals. The

⁵micrograms per liter is a measurement equivalent to parts per billion.

results of the July 24 samplings showed that average concentrations of TCE at the wellhead and at both points of discharge to the irrigation canals fall below the 5.0 ppb cleanup level. No other VOCs were detected at the Phillips well above ARARs. The results of the July 24, 1990 samplings of the Phillips well are as follows:

<u>Location</u>	<u>TCE Concentration (ppb)</u>		
	<u>EPA</u>	<u>ADEQ</u>	<u>GTRC</u>
wellhead	3.1	5.4	5.6
discharge to canal (#1)	3.2	5.6	5.3
discharge to canal (#2)	3.5	5.3	4.6

The Phillips Well lies west and down gradient of the airport portion of the Site. With the exception of the Phillips well, all other groundwater data indicating VOC levels above ARARs were located on or near the airport property. Based on these sampling results, EPA has determined that treatment at the wellhead for the Phillips well is not required at this time. Although treatment is not required, EPA continues to require routine testing for VOC contamination at the Phillips well as part of the remedial action at the PGA Site. This ESD does not alter EPA authority to reimpose the requirement for wellhead treatment at the Phillips Well should future monitoring indicate that the concentration of any VOC has exceeded the cleanup level identified in Table 2-5 (See Attachment 2). EPA's decision to reimpose wellhead treatment will be based on the agency's review of water-quality sampling results for the Phillips well.

D. Soil Remedy Target Area in the Northern Portion of the Site

EPA has received and reviewed information after the ROD was

signed which indicates that the soil remedy target area in the northern portion of the PGA Site is not described clearly. On page four of the 1989 ROD, the soil remedy target area is described as "that area where VOCs were detected in soil samples and the area where soil gas samples quantified VOCs greater than 1 ug/l. The area may be expanded or reduced to include removal of 99 percent of the contaminant". EPA intends for these statements to identify the soil remedy target area for the northern portion of the PGA Site to consist of target areas B and C defined by all four circles in Figure 5-7 of the ROD.

E. Use of Soil Excavation and Treatment in the northern portion of the PGA Site.

EPA has received and reviewed information after the 1989 ROD was signed requesting a clarification of the use of soil excavation and treatment if soil vapor extraction is not effective to meet the required soil cleanup levels. The 1989 ROD states on page four that "excavation and treatment may be required to remove residual contamination where soil vapor extraction is not effective." EPA interprets this to mean that excavation and treatment of soil is one, but not the only, remedial alternative EPA will consider for the soil in the northern portion of the Site if soil vapor extraction is ineffective.

IV. SUPPORT AGENCY COMMENTS

The Arizona Department of Environmental Quality (ADEQ) reviewed this ESD and has concurred with all changes and clarifications herein. ADEQ commented that the ESD should state

that the Phillips well is an agricultural well and not a domestic well. This comment has been incorporated into this ESD.


V. STATUTORY DETERMINATIONS

Considering the new information that has been developed and the changes that have been made to the selected remedy, EPA believes that the remedy remains protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. In addition, the revised remedy uses permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site. The changes and clarifications contained in this ESD are significant but do not fundamentally change the remedy.

VI. PUBLIC PARTICIPATION ACTIVITIES

EPA has presented these changes to the remedy in the form of an Explanation of Significant Differences because the changes are of a significant, but not a fundamental, nature. EPA provided the State of Arizona with a fifteen (15) day comment period on this ESD. In accordance with Section 117(c) of CERCLA, 42 U.S.C. Section 9617(c), EPA will publish a notice in the Arizona Republic newspaper which describes this ESD and its availability for review. This ESD and all documents which support the changes and clarifications herein are contained in the Administrative Record for the PGA Site.

1/24/91
Date


Daniel W. McGovern
Regional Administrator

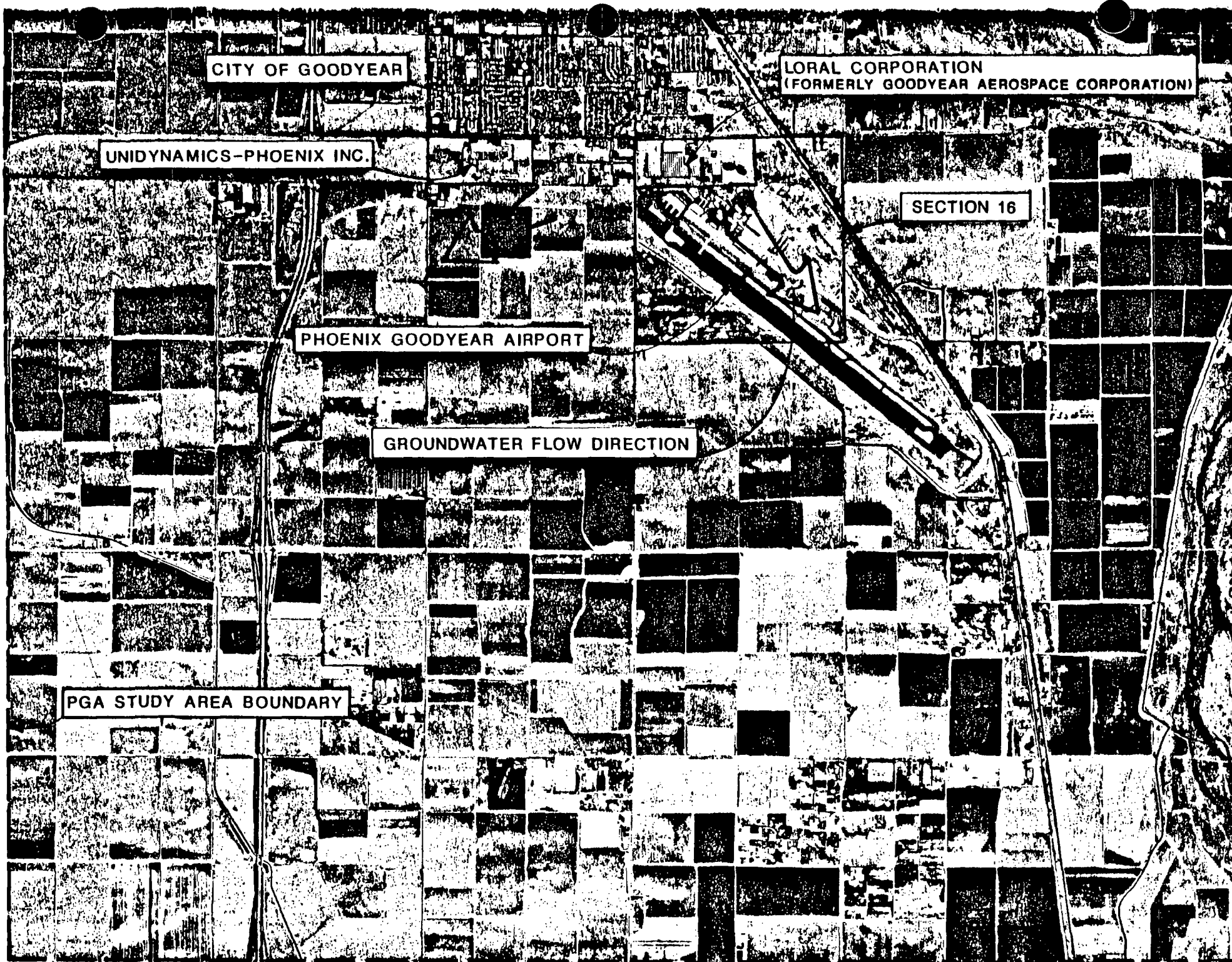


Table 2-5
LEGALLY APPLICABLE
STATE AND FEDERAL REQUIREMENTS AND OTHER CRITERIA
FOR GROUNDWATER
(Concentrations in µg/l)

Compound	Legally Applicable SDWA MCL	Other Criteria				Cleanup Level
		AWQC--Drinking Water Only		ADEQ	Proposed MCL	
		Toxicity	Cancer 10 ⁻⁶ Risk	Action Level Water		
1,1-Dichloroethylene	7		0.033	1		7
1,2-Dichloropropane				1	5	1
Chloroform	100		0.19	3	200	100
Toluene		15,000		340		340
Trichloroethylene	5		2.8	5		5
Trichlorofluoromethane				1		1
Carbon Tetrachloride	5			5		5
Methylene Chloride				1		1
Methyl Ethyl Ketone			170	170		170
Xylenes				440	10,000	440
Antimony		1.46				1.46
Arsenic	50		0.0025			50
Barium	1,000				5,000	1,000
Beryllium			0.0039		5,000	0.0039
Cadmium	10	10			5	10
Chromium	50	50			100	50
Lead	50	50			5	50
Mercury	2	10				2
Nickel		15.4				15.4
Selenium	10	10			50	10
Silver	50	50				50
Zinc		5,000				5,000

Notes: ADEC = Arizona Department of Environmental Quality.
 AWQC = Ambient Water Quality Criteria; adjusted for consumption of
 drinking water only; fish ingestion component removed (U.S. EPA, 1986).
 AWQC (10⁻⁶) = The Ambient Water Quality Criteria resulting in a 10⁻⁶ excess
 lifetime cancer risk (U.S. EPA, 1986).
 MCL = Maximum Contaminant Level.
 MCLG = Maximum Contaminant Level Goal.
 SDWA = Safe Drinking Water Act, 40 CFR 141, November 15, 1985.

Source: U.S. EPA, 1987. IRIS Database.
 Proposed MCLs - Federal Register, May 22, 1989.